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ABSTRACT

This study reports ad hoc findings of a study research project that explored the statistical properties of a questionnaire investigating the factors that motivate individuals to pursue higher education. The researcher used the literature-based, researcher-developed Factors Influencing Participation in Higher Education Questionnaire (S. Harris, 1999) to determine, quantitatively, college-going factors. The sample consisted of 509 participants from 2 southeastern universities. Reliability estimates for the scales ranged from 0.66 to 0.90. Principal components analysis using varimax rotation was used to factor analyze the data. While 10 factors were specified as the extraction criteria, a 9-factor solution was as effective in defining the data, accounting for 43% of the common variance. The three items regarding sisters merged as a separate scale, which the researcher named the Sister's Influence Scale. A post hoc reliability analysis revealed a coefficient alpha of 0.81 for the scale. In addition, a correlation analysis showed that the scale was significantly correlated with 9 of 19 other measures of interest. The significant correlation coefficients ranged from -0.12 to 0.42. The researcher concluded that, although not hypothesized as an original scale, the Sister's Influence Scale is a valid and psychometrically sound scale that warrants further investigation. (Contains 3 tables and 24 references.) (Author/SLD)

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Sisters as a Source of Motivation

For Those Pursuing Higher Education

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A Paper Presented at the 2000 Annual Meeting of the

Mid-South Educational Research Association

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Abstract

The purpose of this study was to report ad hoc findings of a study that explored the statistical properties of a questionnaire that investigated the factors that motivate individuals to pursue higher education. The researcher used the literature-based, researcher developed Factors Influencing Participation in Higher Education (FIPHE) Questionnaire to determine, quantitatively, what those factors are. The sample consisted of 509 participants from two southeastern universities. Reliability estimates for the scales ranged from .66 to .90. Principal components analysis using varimax rotation was used to factor analyze the data. While 10 factors were specified as the extraction criteria, a nine-factor solution was as effective in defining the data, accounting for 43% of the common variance. Consequent to the factor analysis, the three items regarding sisters merged ad a separate scale, which the researcher named Sister's Influence Scale. A post hoc reliability analysis revealed a coefficient alpha of .81 for the scale. In addition, a correlation analysis showed that the scale was significantly correlated with 9 of 19 other measures of interest. The significant correlation coefficients ranged from -.12 to .42. The researcher concluded that although not hypothesized as an original scale, the Sister's Influence Scale is a valid and psychometrically sound scale, which warrants further investigation.

Sisters as a Source of Motivation

For Those Pursuing Higher Education

"Knowledge has become the key resource, for a nation's military strength as for its economic strength. And this knowledge can only be acquired through schooling" (Drucker, 1995, April, p. 37). The push for an educated work force will mean an increased demand in the number of graduates emerging from the classrooms of American colleges and universities. In a recent meeting of the United Nations Educational, Scientific, and Cultural Organization, educators from more than 180 countries agreed that "More people . . . will need post-secondary education to be professionally and technologically skilled" (Murray, 1999, January, p. 11) workers of the 21st century.

Failing to provide an adequate education for American youth is a costly proposition. Consider the fact that across a life span, the average high school dropout loses approximately $230,000 in income. That lost income equates to approximately $69,000 in lost taxes (Eccles, 1997; Renchler, 1990). In addition, earning a college degree increases a person's earning potential by 18% to 45% per year. Over a lifetime, a college degree generates about $41, 400 to $125,500 more in personal income. In turn, this increased personal income generates approximately $12,420 to $37, 650 in potential income taxes (Pascarelli & Terenzini, 1991). It is in America's best interest, financially, to increase its number of college graduates.

Purpose

Taking into account the need for an increased number of college graduates and the aforementioned research, the purpose of this study was to report ad hoc findings of a previous study which investigated the factor structure of the FIPHE Questionnaire; a questionnaire which addresses the factors that influence a person's decision to pursue higher education.

Method

Participants

Participants were students enrolled in general studies classes at two southeastern universities during the 1998 fall quarter (N = 509). College 1 was a large, traditional land-grant university. Participants from this university were 346 undergraduate students enrolled in three sections of a social science course. College 2 was a smaller, nontraditional college. Participants from College 2 were 163 undergraduate students enrolled in six sections of an introductory psychology course. Participants were recruited from a general studies psychology course and several sections of an educational psychology course.

Procedures

Participants, who were assured of the confidentiality of their responses, were recruited through the course instructors. Completed questionnaires were either returned to the instructors or to a place designated by the researcher. The questionnaires were coded to maintain the confidentiality of the participants. Each participant signed an informed consent statement. Participants were granted extra credit for returning completed questionnaires. Participants were also given the opportunity to enter their names into a drawing for $75.00.

Instrument

Details regarding instrument development can be found in Harris (1999). The FIPHE Questionnaire consisted three sections. Section 1 gathered demographic data on the subjects. Section 2 consisted of statements to which the respondents answered using a Likert scale. Section 3 contained true and false items. The following 10 scales are included in the questionnaire:

Self-Efficacy Scale measured a person's perceived competence in a specific area (Bandura, 1993)--the respondent's choice of college major.

Locus of Control Scale assessed a person's perceived locus of control as it relates to pursuing higher education (Conger, Conger, & Elder, 1997).

Parental Support Scale gathered information on the degree to which parents influence a child's decision to pursue higher education (Donnelley, 1988; Haberman, 1987; Seginer, 1983).

Family Support Scale assessed the degree to which family members, other than parents, influence a person's decision to pursue higher education (Haveman & Wolf, 1995; Thompson et al., 1988).

Peer Influence Scale assessed the degree to which peers influence a person's decision to pursue higher education (Fordham & Ogbu, 1986; Steinberg et al., 1992).

Relative Functionalism Scale assessed a person's perception of the relative function of pursuing higher education (Sue & Okazaki, 1990).

Glass Ceiling Effect Scale assessed the degree to which the participants perceived their opportunities for success in college to be limited or blocked (Mickelson, 1990).

Secondary School Support Scale measured the degree to which individuals received adequate support from secondary school personnel such as teachers and guidance counselors (Hoganson, 1995).

Preparation for College assessed a person's general preparation for college (Donnelley, 1988; Merisotis, 1990).

Financial Aid Concern Scale addressed the importance of financial aid for a person's pursuit of higher education (Carter & Wilson, 1993; Donnelly, 1987).

Instrument Scoring

Scores for each scale were obtained by summing the item responses. Items in Section 2 were coded as strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1. Scoring for items in Section 3 were coded as T (true)= 4 and F (false) = 3. Negatively worded items were reversed coded before the scale scores were computed. Instructions for the FIPHE Questionnaire stated that if an item did not apply to a respondent, the respondent was to leave it blank. Blank items were coded as missing data. Missing data were handled through the means imputation procedure. Imputation is defined as "the estimation of a missing value and the subsequent use of that estimate in statistical analyses" (Allison & Gorman, 1993, p. 85). Item means were inserted for items that were missing data. The strategy of replacing missing data with a constant is supported by Cohen and Cohen (1983). They advocated that the practice of filling in missing data with a constant, the mean of an item or a scale, results in losing the smallest amount of information and statistical power. The mean imputation procedure is a conservative approach to handling the occurrence of missing data (Allison & Gorman, 1993).

Design and Statistical Analyses

A cross tabulation procedure was used to calculate the chi-square values. The chi-square statistic was used to determine whether there were significant differences in the observed and expected responses on the demographic variables. A reliability analysis assessed the internal consistency of the scales included in the questionnaire; it measured the degree to which the items in a scale measured a unitary construct (Hair, Anderson, Tatham & Black, 1995; Pedhazur & Schmelkin,

1991). Principal components analysis using varimax rotation was used to factor analyze the data. A reliability analysis was used to determine the relationship among the factors of the questionnaire.

Results

Results from the cross-tabulation procedure indicated significant differences in the observed and expected frequencies for all of the demographic items, thus indicating a fairly heterogeneous sample with regard to most of the demographic variables. Some of the most notable differences are summarized in Table 1.

Insert Table 1 about here

An analysis of the rotated factor matrix revealed that the initial 10 factors specified in the criteria for the procedure accounted for 45% of the common variance of the pattern/structure coefficients. Upon further review, the researcher found that a nine-factor solution accounted for 43% of the variance in the rotated factor matrix. Because the 10th factor was difficult to interpret, the researcher chose the nine-factor solution. The surprising outcome of the factor analysis was the emergence of Factor 6, which was named Sister's Influence. A post hoc reliability analysis revealed a moderately high coefficient alpha (.81) for the scale. Table 2 presents summary descriptive statistics for the scales and subscale of the questionnaire.

Insert Table 2 about here

A correlation analysis showed that the Sister's Influence Scale was significantly correlated with 9 of 19 other measures of interest. The significant correlation coefficients ranged from .This strongest correlation occurred with the Family Influence Factor (r = 42); the second highest occurred with the Mother's Influence Subscale (r = .38). Considering that the items in this factor were originally included in the Family support scale, these correlations are consistent with what the researcher would expect. The weakest correlation occurred with the Glass Ceiling Effect Factor (r = -.12). Table 3 presents a summary of the results.

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concluded that sisters might be pivotal forces in terms of not only encouraging individuals to pursue higher education, but also in persisting after doing so.

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Table 1

Percent of Participant Response by College on Selected Demographic Variables

Demographic variable	Percent College 1	Percent College 2
Age		
25 years of age or less	94.4	74.3
26 years of age or older	4.6	25.8
Degree expectation		
Bachelor's degree or less	25.8	46.1
Master's degree or higher	74.2	53.9
Employed	44.2	81.0
Ethnicity/race		
Caucasian	89.6	49.7
Minority	11.4	50.3
Financial support for college		
Family	55.0	15.3
Self	14.9	84.1
Student loans	16.5	3.7
Father' educational level (college graduate)	68.8	28.8
Mother's educational level (college graduate)	57.5	22.1

Note: This table only represents partial results from the cross-tabulation procedure.

Table 2

Table of Summary Descriptive Statistics for FIPHE Scales

Scale	n[a]	M[b]	SD[b]	M[c]	SD[c]	Alpha[d]
Family Influence Scale	28	3.29	.39	82.15	10.84	.90
Secondary School Support Scale	12	3.06	.37	36.68	6.72	.89
Self-Appraisal Scale	18	3.43	.20	61.72	6.50	.86
Relative Functionalism Scale	9	3.5	.20	31.54	4.50	.87
Peer Influence Scale	6	3.48	.22	20.85	2.79	.77
Sister's Influence Scale	3	3.22	.17	9.65	2.00	.81
Preparation for College Scale	6	3.14	.03	18.82	1.35	.68
Financial Aid Concern Scale	7	2.65	.56	18.56	3.87	.66
Glass Ceiling Effect Scale	5	1.73	.22	8.64	2.58	.66
Self-Efficacy Subscale	8	3.45	.17	27.91	3.31	.81
Locus of Control Subscale	10	3.41	.22	34.10	4.12	.79
Mother's Influence Subscale	9	3.44	.33	30.97	4.20	.81
Father's Influence Subscale	9	3.23	.46	29.04	5.26	.85

Note. N = 509 for all scales.

[a]n Number of items for the scale. [b]Descriptive statistics for item means. [c]Descriptive statistics for the scale. [d]Alpha after scales were revised based on the results from the factor analysis.

Table 3

Results from the Correlation Analysis for the Measures of Interest

Scale	FI	PI	GC	LC	RF	FA	SS	PC	SE	MI	FN	SI	DE	MX	ME	MO	FX	FE	FO
FI	1.00																		
PI	.48**	1.00																	
GC	-.24**	-.27**	1.00																
LC	.20**	.15*	-.34**	1.00															
RF	.46**	.35**	-.33**	.22**	1.00														
FA	-.24**	-.20**	.03	.16**	-.12*	1.00													
SS	.49**	.44**	-.28**	.16**	.36**	-.11	1.00												
PC	.20**	.17**	-.08	.09	.06	-.02	.23**	1.00											
SE	.40**	.40**	-.33**	.45**	.40**	-.02	.38**	.16**	1.00										
MI	.89**	.37**	-.19**	.20**	.42**	-.16**	.40**	.18**	.29	1.00									
FN	.90**	.41**	-.20**	.10	.41**	-.28**	.40**	.18**	.29**	.73**	1.00								
SI	.42**	.18**	-.12*	.03	.21**	-.11	.22**	.08	.29**	.37**	.26**	1.00							
DE	-.04	.03	-.02	.09	.10	.17**	.02	.02	.19**	.01	-.10	-.01	1.00						
MX	.24**	.12*	.00	.01	.12*	.04	.13*	.07	.15*	.26**	.22**	.09	.31**	1.00					
ME	.28**	.16**	.04	-.07	.24**	-.26**	.14*	.10	.05	.23**	.28**	.10	-.02	.26**	1.00				
MO	.15*	.07	-.01	.10	.07	-.02	.07	.08	.12	.14*	.10	.19**	-.01	.21**	.46**	1.00			
FX	.31**	.19**	-.05	.08	.23**	-.03	.13*	.02	.23**	.31**	.32**	.08	.24**	.74**	.23**	.13*	1.00		
FE	.28**	.17**	-.02	-.11	.24**	-.31**	.14*	.03	.05	.20**	.31**	.07	-.04	.16**	.50**	.19**	.38**	1.00	
FO	.34**	.27**	-.05	-.01	.26**	-.24**	.15*	.02	.12*	.26**	.40**	.06	.02	.18**	.38**	.14*	.34**	.60**	1.00

Table continues

Note. FI = Family Support Scale; PI = Peer Influence Scale; GC = Glass Ceiling Effect Scale; LC = Locus of Control Scale; RF = Relative Functionalism Scale; FA = Financial Aid Concerns Scale; SS = Secondary School Support Scale; PC = Preparation for College Scale; SE = Self-Efficacy Scale; MI = Mother's Influence Subscale; FN = Father's Influence Subscale; SI = Sister's Influence Scale; DE = Degree expectation; MX = Mother's expectation; ME = Mother's education; MO = Mother's occupation; FX =Father's expectation; FE = Father's education; FO = Father's occupation.

*$p < .05$. **$p < .01$.